Project Fact Sheet

Development of Strategies for Energy-Efficient Transition from Low Pressure Non-Reinforced Concrete Pipe

GOALS

- Enable farmers to convert to pressurized irrigation (drip and sprinkler).

PROJECT DESCRIPTION

There are approximately 1,400 miles of low-pressure non-reinforced cast-in-place ("monolithic" or "CIP") concrete pipe in California irrigation districts. They are predominately found on the east-side of the San Joaquin Valley, from Manteca in the north to Visalia in the south. Many of these pipelines were installed in the early 1900's. Most of these pipes are deteriorating and will need to be replaced within the next 10-20 years.

Installation of new pipe at Irrigation District Project

Irrigation districts have attempted to find new ways to repair these pipes. However, their uneven dimensions (they were often made with crude local installation equipment), high density of repairs (meaning that the pipe wall thickness and cross sections now vary), numerous connections, and non-linear placement has ruled out using available pipe liner technology. The cost to line these pipes are about the same as the cost to completely replace the pipelines.

However, the districts must not only replace the pipe itself - they must change the way they deliver the water to their customers. The old pipelines were designed for surface irrigation (on-farm) but many farmers now need water for pressurized irrigation methods. Irrigation districts have many questions about how to make the transition, including:

a. Should the new pipeline be capable of supplying water for both surface and pressurized irrigation methods?
b. Should the water be pressurized by the district at the canal, so that farmers do not need to pressurize the water with smaller, less efficient pumps?
c. Should the water be filtered, and if so, to what degree?
d. How should the new pipelines be integrated with the old, existing CIP pipelines?

BENEFITS TO CALIFORNIA

Successful research will impact numerous energy issues. These include:

- Reduction in groundwater pumping (because surface water deliveries will be more flexible, and water tables will remain at higher levels), thus reducing electricity consumption.
- Elimination of future increases in groundwater pumping which will occur if the present water delivery infrastructure is not significantly improved, thus reducing escalations in energy consumption.
- Increased yield per unit of energy consumed, thus improving efficiency ratios.
- More efficient fertilizer practices, thus reducing indirect energy consumption.
- Planning for water transfers throughout the state.
- Reduced vehicular travel (due to automatic systems and remote monitoring), thus reducing fuel energy use and reducing engine emissions, and
- Reduced deterioration of groundwater quality and quantity.

FUNDING AMOUNT

California Energy Commission: $525,000

PROJECT STATUS

- ITRC continues to communicate with SSJID and Provost and Prichard Engineering
- A paper was presented at the USCID/ASCE meeting in San Luis Obispo in June, regarding the South San Joaquin ID project.and to provide technical input. Calpoly completed a re-calibration and update of their main canal gate algorithm, to help ensure reliable deliveries to their new project.
- Hancor is still in the process of testing its new coupler and lining designs. Calpoly has met with the primary Hancor engineering representative in June, and he now anticipates that the new design will be available in early September. Calpoly is waiting for the availability of the pipe. Chowchilla ID's manager has stated a willingness to cooperate with some field-testing.

FOR MORE INFORMATION

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